

Dr. C. VALLI NACHIYAR

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Age and DOB : 33 yrs (05-03-1973)
Languages Known : Tamil, English & Hindi

Academic qualification

2004 **Ph.D. Environmental toxicology- Biotechnology**

Title of the Thesis: **Studies on the biodegradation of certain azo dyes and aromatic amines by *Pseudomonas aeruginosa***

1995 **M.Sc. Environmental Toxicology**, in the **Department of Pharmacology and Environmental Toxicology**, University of Madras

Papers Studied: Fundamentals of Drug Toxicology, Instrumental Methods in Toxicological Analysis, Forensic Toxicology, Aquatic Toxicology, Genetic and Industrial toxicology, Food Toxicology, Pesticide Toxicology and Drug Toxicology

1993 **B.Sc. Botany**, University of Madras

Post Graduate Diploma in Computer Applications

Typewriting (Higher Grade)

Merits and Awards

Have qualified in the National Eligibility Test (**NET**) for Junior Research Fellowship and Lecturership conducted by **Council of Scientific and Industrial Research, India** and awarded the research fellowship for the research work.

Have qualified in the Graduate Aptitude Test in Engineering - 1998 (**GATE - Life Sciences**) with the score of 79.39 percentile.

Teaching Experience

Presently working in Sathyabama Institute of Science and Technology as a Lecturer in the Department of Biotechnology for the past one and half years. Worked as a part time Lecturer in Anna University teaching 'Clinical Biochemistry' for M.Sc. Medical Physics students for 2 years.

Research Techniques Known

Isolation and maintenance of pure microbial cultures

Spectroscopic techniques such as UV-Visible, Infra Red

Chromatographic techniques such as HPLC, GC-MS

Electrophoretic techniques

Nucleic acid Isolation

Purification and Characterization of Proteins

Immunological techniques

List of Publications

1. Degradation of tannery and textile dye, Navitan fast blue S5R by *Pseudomonas aeruginosa*

C. Valli Nachiyar and Suseela Rajkumar

World Journal of Microbiology and Biotechnology, Vol 19 (6) 609-614

2. Mechanism of degradation of Navitan Fast Blue S5R by *Pseudomonas aeruginosa*

C. Valli Nachiyar and G. Suseela Rajkumar

Chemosphere, 2004, Vol 57 (3) 165-169

3. Purification and characterization of an oxygen-insensitive azoreductase from *Pseudomonas aeruginosa*

C. Valli Nachiyar and G. Suseela Rajkumar

Enzyme and Microbial Technology, 2005, Vol 36: 503-509

Papers under revision

1. Biodegradation of ANSA by *Pseudomonas aeruginosa*
C. Valli Nachiyar and G. Suseela Rajkumar (Industrial Journal of Microbiology and Biotechnology) – Accepted for publication
2. Biodegradation of metanilic acid by *Pseudomonas aeruginosa* (Enzyme and Microbial Technology)
C. Valli Nachiyar, K. Vijayalakshmi, D. Muralidharan and G. Suseela Rajkumar

Papers under preparation

1. Degradation of Amidoblack 10 B by *Pseudomonas fluorescense*
C. Valli Nachiyar, K. Vijayalakshmi, Sapna C.D. and G. Suseela Rajkumar
2. Degradation of Eriochrome blue black by *Pseudomonas fluorescense*
C. Valli Nachiyar, K. Vijayalakshmi and G. Suseela Rajkumar

Poster Presentation

Biodegradation of azo dyes by *Alcaligenes* sps.

C. Valli Nachiyar and G. Suseela Rajkumar

34th Leather Research Industry Get Together (LERIG), January 27-30, 2000

Oral Presentation

Antimicrobial potentials of certain microbial peptides for wound healing and other biomedical applications

G. Suseela Rajkumar, R. Judith, T. Savitha Jayavardhini, C. Rose, **C. Valli Nachiyar*** and K. Vijayalakshmi

International meet on wound healing, 'Woundcon' 2003 Feb 22-23, 2003

Abstract of the research work

Doctoral Work

Azo dyes, the most important group of organic colourants have wide range of applications in the textile, leather, paper, food, pharmaceutical and cosmetic industries. Waste water from these industries and dye manufacturers results in the pollution of aquatic system. Even though pollution due to azo dyes is comparatively less, they gain importance as some of their reduction products are well known for their carcinogenic and mutagenic effects. Some of the dyes, which are known to form carcinogenic amines, have already been banned. Complete mineralization of dye is possible only if anaerobic reduction is followed by aerobic oxidation. While physical and chemical methods of dye removal are available, biological method of dye – containing effluent may be the best alternative as this leads to the complete mineralization of dyes.

In this study, I have isolated *Pseudomonas aeruginosa*, which could catalyze the reduction of azo bond even under aerobic condition showing the presence of oxygen insensitive azo reductase. The amines formed were also further degraded. An attempt has been made to identify few of the compounds, so as to predict the pathway. The first enzyme in this reaction, azo reductase has been isolated, purified and characterized. Finally, the applicability of the above reaction has been tested using dye – containing tannery effluent and various parameters have been studied.

Other Research Work

Bacterial strains producing antimicrobial peptides (AMP) were selected after extensive screening of bacterial isolates obtained from different sources. Of the 56 isolates two bacterial strains showing higher antimicrobial activities were selected for AMP production. The AMPs were evaluated on MRS agar plates and found to have excellent antimicrobial activities against 36 bacterial strains of pathogenic and non-pathogenic types including *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*. AMP production appears to be maximal at late exponential period at 30-37°C at pH 6.0-6.5. The antimicrobial peptides were partially purified and some of its biochemical properties were characterized.

References

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